

AMENDMENTS TO THE CLAIMS

1. (Currently amended) An energy-curable coating composition comprising a water-soluble or water-dispersible binder capable of being polymerised by exposure to a source of radiation, [[a]] particulate electrically conductive material ~~consisting of a metal or metal oxide or mixture thereof~~, and water as a non-reactive diluent, and, optionally, a photoinitiator, the composition, when cured, having a resistivity no greater than 1 ohm/square, as measured by ASTM F1896-98, and wherein all particulate electrically conductive material in the composition consists of a metal or metal oxide or mixture thereof.
2. (Original) A composition according to Claim 1, in which the binder comprises at least a polymerisable monomer, prepolymer or oligomer capable of polymerisation by radiation and including at least one component which is water-soluble or water-dispersible.
3. (Previously presented) A composition according to Claim 2, in which the binder comprises a water-soluble or water-dispersible oligomer or prepolymer capable of being polymerised by radiation or a water-soluble monomer capable of being polymerised by radiation, or both and optionally a water-insoluble monomer capable of being polymerised by radiation.
4. (Previously presented) A composition according to Claim 3, in which the binder comprises:
 - (a) a water-soluble or water-dispersible oligomer or prepolymer capable of being polymerised by radiation,

- (b) a water-soluble monomer capable of being polymerised by radiation,
- (c) a water-insoluble monomer capable of being polymerised by radiation,
- (d) said particulate electrically conductive material,
- (e) water as a solvent or dispersant, and
- (f) optionally a photoinitiator.

5. (Previously presented) A composition according to Claim 1, in which the binder comprises a water-soluble or water-dispersible urethane, polyester or epoxy resin containing acrylate ester groups or residues or both.
6. (Previously presented) A composition according to Claim 4, in which said water-soluble or water-dispersible oligomer or prepolymer (a) is a water-soluble or water-dispersible urethane, polyester or epoxy resin containing acrylate ester groups or residues or both.
7. (Previously presented) A composition according to Claim 1, in which the binder comprises an ester of acrylic or methacrylic acid with polyethylene glycol or with a mono-, di-, tri-, or tetra-hydric alcohol derived by ethoxylating a mono-, di-, tri-, or tetra-hydric aliphatic alcohol of molecular weight less than 200 with ethylene oxide.
8. (Original) A composition according to Claim 4, in which said water-soluble monomer (b) is an ester of acrylic or methacrylic acid with polyethylene glycol or with a mono-, di-, tri-, or tetra-hydric alcohol derived by ethoxylating a mono-, di-, tri-, or tetra-hydric aliphatic alcohol of molecular weight less than 200 with ethylene oxide.

9. (Previously presented) A composition according to Claim 1, in which the binder includes an acrylate or methacrylate ester of a mono-, di-, tri-, tetra-, penta-, or hexa-hydric alcohol having a molecular weight of less than 300.
10. (Previously presented) A composition according to Claim 4, in which said water-insoluble monomer (c) is an acrylate or methacrylate ester of a mono-, di-, tri-, tetra-, penta-, or hexa-hydric alcohol having a molecular weight of less than 300.
11. (Canceled)
12. (Previously presented) A composition according to Claim 1, in which said metal is silver, copper, nickel, tin, or platinum, or a mixture or alloy including at least one of these metals.
13. (Previously presented) A composition according to Claim 4, in which said water-soluble or water-dispersible oligomer or prepolymer (a) is present in an amount of from 2 to 15% by weight of the total composition.
14. (Previously presented) A composition according to Claim 4, in which said water-soluble monomer (b) is present in an amount of from 2 to 10% by weight of the total composition.
15. (Previously presented) A composition according to Claim 4, in which said water-insoluble monomer (c) is present in an amount of from 1 to 8% by weight of the total composition.

16. (Previously presented) A composition according to Claim 4, in which said conductive material (d) is present in an amount such that the weight ratio of (d) to (a) plus (b) plus (c) is at least 2: 1.
17. (Original) A composition according to Claim 16, in which said ratio is at least 3: 1.
18. (Original) A composition according to Claim 17, in which said ratio is no greater than 6:1.
19. (Previously presented) A composition according to Claim 1, in which said conductive material is present in an amount of from 30 to 90% by weight of the total composition.
20. (Previously presented) A composition according to Claim 1, in which said conductive material is present in an amount of at least 35% by weight of the total composition.
21. (Original) A composition according to Claim 20, in which said conductive material is present in an amount of at least 40% by weight of the total composition.
22. (Previously presented) A composition according to Claim 1, in which said water is present in an amount of from 1 to 60% of the total composition.
23. (Original) A composition according to Claim 22, in which said water is present in an amount of from 1 to 40% of the total composition.
24. (Currently amended) A composition comprising:

- (a) from 2 to 15% by weight of a water-soluble or water-dispersible oligomer or prepolymer capable of being polymerised by radiation,
- (b) from 2 to 10%, by weight of a water-soluble monomer capable of being polymerised by radiation,
- (c) from 1 to 8% by weight of a water-insoluble monomer capable of being polymerised by radiation,
- (d) sufficient of [[a]] particulate electrically conductive material ~~consisting of a metal or metal oxide or mixture thereof~~ such that the ratio of said electrically conductive material to components (a), (b) and (c) is at least 2:1, wherein all particulate electrically conductive material in the composition consists of a metal or metal oxide or mixture thereof,
- (e) from 1 to 60% by weight of water as a non reactive diluent, and
- (f) optionally from 0.5 to 10% by weight of a photoinitiator,

the composition, when cured, having a resistivity no greater than 1 ohm/square, as measured by ASTM F1896-98.

25. (Previously presented) A composition according to Claim 1, having, when cured, a resistivity no greater than 10^{-1} ohm/square, as measured by ASTM F1896-98.

26. (Previously presented) A composition according to Claim 25, having, when cured, a resistivity no greater than 10^{-2} ohm/square, as measured by ASTM F1 896-98.

27. (Previously presented) A process for producing a printed electrically conductive coating, in which a composition according to Claim 1 is printed onto a substrate, and is then energy cured by exposure to a source of actinic radiation.

28. (Previously presented) A process according to Claim 27, in which said radiation is ultraviolet or electron beam.

29. (Currently amended) A composition comprising:

(a) from 4 to 14% by weight of a water-soluble or water-dispersible oligomer or prepolymer capable of being polymerised by radiation,

(b) from 2 to 9%, by weight of a water-soluble monomer capable of being polymerised by radiation,

(c) from 3 to 7% by weight of a water-insoluble monomer capable of being polymerised by radiation,

(d) sufficient of [[a]] particulate electrically conductive material ~~consisting of a metal or metal oxide or mixture thereof~~ such that the ratio of said electrically conductive material to components (a), (b) and (c) is at least 3:1, wherein all particulate electrically conductive material in the composition consists of a metal or metal oxide or mixture thereof,

(e) from 1 to 40% by weight of water as a non reactive diluent, and

(f) from 1 to 5% by weight of a photoinitiator, the composition, when cured, having a resistivity no greater than 10^{-2} ohm/square, as measured by ASTM F1896-98.

30. (Previously presented) A composition according to Claim 29, in which said metal is silver, copper, nickel, tin, or platinum, or a mixture or alloy including at least one of these metals, said conductive material (d) is present in an amount such that the weight ratio of (d) to (a) plus (b) plus (c) is at least 2: 1 and no greater than 6:1, which said conductive material is present in an amount of at least 40% by weight of the total composition, and the composition, when cured, having a resistivity no greater than 10^{-1} ohm/square, as measured by ASTM F1896-98.